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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ONEILL, KARIE AMBER

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,655	Applicant(s) TODE ET AL.	
	Examiner Karie O'Neill	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,7-9,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-9,11 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant's amendment filed on June 29, 2009, was received. Claims 1 and 3 have been amended. Claims 4, 6, 10 and 13-16 have been cancelled. Therefore, Claims 1-3, 5, 7-9 and 11-12 are pending in this office action.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on February 27, 2009.

Claim Rejections - 35 USC § 112

3. The rejection of Claims 6 and 10 under 35 U.S.C. 112, second paragraph, have been overcome based on the amendments to the claims and the arguments presented on pages 6-7 of the Remarks dated June 29, 2009.

Claim Rejections - 35 USC § 102

4. The rejection of Claims 1, 7 and 8 under 35 U.S.C. 102(b) as being anticipated by Okabe et al. (JP 2003-031219) are maintained. The rejection is repeated below for convenience.

With regard to Claim 1, Okabe et al. discloses a non-aqueous electrolyte secondary battery which has a positive electrode containing a positive active material, a negative electrode containing a negative active material and a non-aqueous electrolyte solution (paragraphs 0006 and 0016), said secondary battery being characterized in that said positive active material comprises a lithium transition metal complex oxide,

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further comprising zirconium in the amount by mole of from 0.1% to 1%, based on the total amount of said transition metals (paragraph 0027). The positive active material contains a compound represented by the formula $\text{Li}_{1+a}\text{Mn}_x\text{Ni}_y\text{Co}_z\text{M}_b\text{O}_2$, wherein M is an element other than Li, Mn, Ni, or Co, and $0 \leq a \leq 0.1$, $-0.1 \leq x - y \leq 0.1$, $y \leq x + z + b$, $0 < z \leq 0.4$, $0.3 \leq y$, $0.3 \leq x$, and $x + y + z + b = 1$. M can be any of a number of elements, including Zr, in an amount preferably 5% or $b \leq 0.05$ (paragraphs 0024-0026).

With regard to Claim 7, Okabe et al. discloses wherein said lithium transition metal complex oxide contains substantially the same amount of Ni and Mn. See Examples and paragraphs 0072, 0086 and 0090.

With regard to Claim 8, Okabe et al. discloses wherein said positive active material has a specific surface area of $0.3\text{-}1.5\text{m}^2/\text{g}$ (paragraph 0028).

Claim Rejections - 35 USC § 103

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (JP 2003-031219), as applied to Claims 1, 7 and 8 above.

Okabe et al. discloses the non-aqueous electrolyte secondary battery in paragraph 4 above, including a potential between 4.3V-3.0V (paragraph 0019), but does not disclose wherein said positive electrode in a fully charged state has a potential of at least 4.5 V (vs. Li/Li^+). Okabe et al. discloses a non-aqueous electrolyte secondary battery with the electrode noted having zirconium in the amount from 0.1% to 5% mole percent.

Based on the teachings of Okabe, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an electrode with a fully charged state with a potential of at least 4.5 V in order to provide a complete and fully charged battery cycle performance based on the materials disclosed in order to improve the high charging and discharging performance, which would provide the positive electrode with the ability have a fully charged potential of at least 4.5 V. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05.

6. Claims 3, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (JP 2003-031219).

With regard to Claim 3, Okabe et al. discloses a non-aqueous electrolyte secondary battery which has a positive electrode containing a positive active material, a negative electrode containing a graphite material as a negative active material (paragraph 0041) and a non-aqueous electrolyte solution (paragraphs 0006 and 0016) and which is designed to be charged with an end-of-charge voltage of 3.0V-4.3V (paragraph 0019), said secondary battery being characterized in that said positive active material comprises a lithium transition metal complex oxide (paragraph 0027) and comprising, in addition to said at least Ni and Mn, zirconium in the amount by mole of from 0.1% to 5 %, based on the total amount of said transition metals. The positive active material contains a compound represented by the formula $\text{Li}_{1+a}\text{Mn}_x\text{Ni}_y\text{Co}_z\text{M}_b\text{O}_2$, wherein M is an element other than Li, Mn, Ni, or Co, and $0 \leq a \leq 0.1$, $-0.1 \leq x-y \leq 0.1$,

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$y \leq x + z + b$, $0 < z \leq 0.4$, $0.3 \leq y$, $0.3 \leq x$, and $x + y + z + b = 1$. M can be any of a number of elements, including Zr, in an amount preferably 5% or less, or $b \leq 0.05$ (paragraphs 0024-0026).

Okabe et al. does not specifically disclose wherein the end-of-charge voltage is 4.4 V, and does not specifically disclose wherein the content of zirconium is in the amount by mole of from 0.1% to 1%, based on the total amount of said transition metals. However, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use an electrode with a fully charged state potential of at least 4.4 V in order to provide a complete and fully charged battery cycle performance based on the materials disclosed. Further, it would have been obvious to one of ordinary skill in the art to use zirconium in the amount of 0.1% to 1% to improve the high charging and discharging performance, which would provide the positive electrode with the ability have a fully charged potential of at least 4.5 V. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05.

With regard to Claim 11, Okabe et al. discloses wherein said lithium transition metal complex oxide contains substantially the same amount of Ni and Mn. See Examples and paragraphs 0072, 0086 and 0090.

With regard to Claim 12, Okabe et al. discloses wherein said positive active material has a specific surface area of $0.3\text{--}1.5\text{m}^2/\text{g}$ (paragraph 0028).

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7. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okabe et al. (JP 2003-031219), as applied to Claims 1, 2, 3, 5, 7, 8 and 11-12 above, and in further view of Uemura et al. (US 2002/0012830 A1).

Okabe et al. discloses the non-aqueous electrolyte secondary battery in paragraphs 4 and 6 above, but does not disclose wherein a ratio in capacity of said negative electrode to said positive electrode (negative electrode/positive electrode) in their portions opposed to each other is in the range of 1.0 - 1.3.

Uemura et al. discloses a rechargeable lithium battery including a positive electrode with a positive active material made of a layered lithium manganese complex oxide, such as $\text{Li}_{2/3}\text{Mn}_{1/2}\text{Ni}_{1/2}\text{O}_2$ (paragraphs 0035 and 0041). Uemura et al. also discloses a capacity balance ratio B/A of the total capacity B of the negative electrode material to the total capacity A of the positive electrode material is preferably fixed at a range of 1 to 1.5.

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to have a ratio capacity of said negative electrode to positive electrode in the range of 1.0-1.5 in the battery of Okabe et al., because Uemura et al. teaches that if the capacity balance ratio B/A is below 1, lithium ion holding sites on the negative electrode material become insufficient. As the result, branch-shaped or needle-shaped crystal (dendrite crystal) tends to occur during the charge to cause a short circuit phenomenon between the positive electrode and the negative electrode. If the capacity balance ratio B/A exceeds 1.5, negative electrode sites that do not contribute

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to the charge-discharge are increased, leading to the wasteful use of materials (paragraph 0033).

Response to Arguments

8. Applicant's arguments filed June 29, 2009, have been fully considered but they are not persuasive.

Applicant argues that, "a person skilled in the art would not have been motivated and would not have had any reason to modify the compound oxide of Okabe to include zirconium in an amount as recited in claims 1 and 3 with predictable results. First, Zr is not included among the elements preferred as the element M in the compound oxide in paragraph [0025]. Also, there is no specific example using Zr as element M."

As pointed out in the rejection and in the paragraph above, Okabe does include Zr as one of the elements preferred as the element M in the compound oxide. Paragraph 0025 lists several elements which can constitute M in the compound oxide, including Zr. Just because it is not used in any of the examples, does not mean that it cannot be used or have positive results.

Second, Applicant argues that "Okabe discloses that the amount of element M is preferred to especially satisfy $b \leq 0.05$ to "show higher safety." This description is an implicit teaching or suggestion that lesser amounts of M will not provide the desired safety and leads away from reducing the amount of M to an amount as low as 1 mole %."

Okabe discloses element M in an amount equal to 5% or less and that satisfying this formula "can" show higher safety. The reference does not disclose that amounts less than 5% do not show higher safety or that they are not safe at all. Therefore, Applicant's argument is not persuasive, and the reference meets the claim limitations.

Finally, Applicant argues that, "although there may be case law that suggests that in certain circumstances, the discovering of an optimum amount of a result effective variable involves only routine skill in the art, the Office must first establish that the variable is, in fact, a result effective variable. There is no basis in Okabe to support the position of the Office that a reduced amount of M is a result effective variable".

Applicant's argument is not persuasive. Applicant has established in the claims and the arguments that Zr is a result effective variable by stating that it is only to be included in an amount of from 0.1% to 1% based on the total amount of transition metals. All of Applicant's arguments are directed to the amount and effect that Zr has on the invention, leading one to believe that this is where the novelty of the invention lies and that it is a result effective variable to the chemical formula claimed.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Karie O'Neill
Examiner
Art Unit 1795

KAO